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**PERIODONTAL THERAPY INSTRUMENT**

The present invention relates to an instrument for periodontal treatment and more particularly to an instrument permitting scaling and root surface treatment for the purpose of cleaning the periodontal pockets.

Such instruments consisting of manual curettes, or of inserts mounted on vibratory handpieces, are already known at present. However, the rigidity of the existing instruments does not permit treatment of the periodontal pockets or satisfactory cleaning of the furcations, thus forcing the practitioner to practice traditional methods of periodontal surgery involving cutting of flaps.

An instrument with which it is possible to overcome the aforementioned disadvantages is also known in particular from the patent EP 0 715 508 B1 filed by the present Applicant. This instrument comprises a shank and a blade; the latter has an active part with two sectors distributed along the blade and each situated on either side of a plane passing through the axis of the blade. These two sectors have different levels of aggressiveness, with the result that, during treatment, with the instrument introduced into the periodontal pocket, the more aggressive sector comes into contact with the root surface of the tooth, and the less aggressive sector comes into contact with the mucosa. Said blade is held, by way of its shank, on a handpiece which imparts a vibratory movement to it in order to allow both sectors to detach the tartar to be removed.

Although such an instrument is satisfactory, it continues to be the subject of refinements aimed at improving comfort for patient and practitioner alike.

To this end, the subject of the present invention is an

instrument for periodontal treatment, comprising a blade connected integrally to a head intended to be coupled to a handpiece so as to impart to said blade a vibratory movement, said blade having, on one of the sides delimited  
5 by a plane passing through its axis, an active part distributed along the blade, characterized in that said blade is additionally provided with an irrigation channel for liquid arranged at its center, this channel opening out at the center of the active part of said blade along the  
10 major part of its length, thus ensuring, on the one hand, cleaning of the active part of the tool during the procedure, and, on the other hand, removal of the detached particles.

According to an advantageous characteristic of the  
15 present invention, said blade is provided with a plane intersecting with said channel and thus providing the opening of the channel on the active part, and this plane of intersection is inclined with respect to the axis and defines the active part of the blade on which is arranged,  
20 on each side of the opening of the channel, a plurality of notches or any other similar configuration affording a surface roughness adequate for its use.

According to one embodiment variant, the end of the blade has a curvature.

25 According to another embodiment variant, the end of the blade is able to be curved by the practitioner for adapting it to the particular case being treated, for example for access to the furcations.

Still according to the invention, the blade is mounted  
30 in an articulated manner on said head, for example by means of a hinge of the ball-and-socket type, thus affording the possibility of orienting the position of the active part of the blade with respect to the grip of the apparatus.

According to an embodiment variant, the end remote from the free part of said blade is provided with a means for detachable fixation to the head.

According to one embodiment, this means for detachable  
5 fixation of the blade comprises a bushing which can be maneuvered in particular by the practitioner and on which the blade is connected integrally, and this bushing is additionally provided with an annular groove which, in the mounted position on said head, forms a leaktight annular  
10 chamber for communication between the irrigation channel of the blade and a delivery channel for liquid arranged on the head.

According to another advantageous characteristic of the invention, said head is provided with a channel for delivery  
15 of liquid which is linked to the irrigation channel of the blade.

According to yet another advantageous characteristic of the invention, the entry point of the liquid is external or internal to the handpiece.

20 The abovementioned characteristics of the invention, and others too, will appear more clearly on reading the following description of an illustrative embodiment, with reference to the attached drawings, in which:

- Figure 1 is a side view of an instrument according  
25 to the present invention, and

- Figure 2 is a view similar to Figure 1, illustrating an embodiment variant of the present invention.

Figure 1 depicts an instrument for dental surgery, in particular an instrument for periodontal treatment,  
30 comprising a blade 1, also designated as an insert,

connected integrally to a head 2 which is coupled removably and interchangeably to a handpiece (not shown).

According to the embodiment shown, said blade 1 has a circular cross section and, on one of the sides delimited by  
5 a plane passing through the axis of the blade, it has an active part 1a distributed along said blade.

This active part 1a is made up of a plurality of notches 3 projecting from the blade and arranged on parallel planes, thus giving it the desired surface roughness. Thus,  
10 during treatment, with the instrument introduced into the periodontal pocket, the active part 1a of the blade (that is to say the part provided with a surface roughness) comes into contact with the root surface of the tooth, and the other part 1b of the blade, that is to say the less  
15 aggressive part or even smooth part, comes into contact with the mucosa.

It will be noted that these planes can be inclined with respect to the plane perpendicular to the axis of the instrument in order to ensure greater efficacy of the blade.

According to the present invention, said blade 1 is provided with an irrigation channel 4 for liquid arranged at its center, this channel 4 opening out at the center of the active part 1a of said blade 1 along the major part of its length, thus ensuring, on the one hand, cleaning of the  
20 active part of the tool during the procedure and, on the other hand, removal of the detached particles, as is explained in greater detail below.  
25

According to a preferred embodiment of the invention, in order to provide the opening 5 of the channel 4 on the  
30 active part 1a, said blade 1 is provided with a plane 6 intersecting with said channel 4. This plane of intersection 6 is advantageously inclined with respect to the axis and

defines the active part 1a of the blade 1 on which is arranged, on each side of the opening of the channel, the plurality of notches 3 or any other similar configuration providing a surface roughness adequate for its use.

5       The end remote from the free part of said blade 1 is provided with a means for detachable fixation to the head.

According to one embodiment, this means of fixation is composed of a bushing 7 which can be maneuvered in particular by the practitioner and on which the blade is  
10 integrally connected in order to allow it to be detached from the head and make it interchangeable.

This bushing 7 is additionally provided with an annular groove 8 which, in the mounted position on said head 2, forms an annular chamber 9 rendered leaktight by the  
15 provision, on either side of said chamber 9, of a sealing member 10 and 11, as is illustrated in Figure 1.

This annular chamber 9 provides the communication between the irrigation channel 4 of the blade 1 and a delivery channel 12 for liquid such as water, disinfectant  
20 or any other product intended principally to irrigate the tissues during treatment, said delivery channel 12 being arranged on the head 2.

It will be noted that the entry point of the liquid may be external to the handpiece, as is illustrated in Figure 1,  
25 or internal to the handpiece.

Said head 2 is mounted preferably on an ultrasound-generating apparatus whose ultrasonic vibrations have intrinsic antibacterial properties. Also, by virtue of these vibrations, said blade 1 is able to reach and file the  
30 tooth, without damaging the residual connective tissue surrounding it.

The way in which the instrument for periodontal treatment according to the invention is used will already be evident from the above description.

5 The practitioner mounts the instrument onto a handpiece and connects the delivery channel 12 for liquid to an entry point, then places the face of the active part 1a in contact with the root surface of the tooth.

10 The vibration of the instrument thus brings about removal of the granulated tissue of the mucous wall of the periodontal alveolus, and surface treatment of the root. Direct irrigation on the blade, by way of the channel 4, permits removal of the debris and thus better visibility of the site for the practitioner.

15 It will be noted that the end of the blade 1 can be pre-curved or can be manually shaped by the practitioner, depending on the anatomy of the tooth to be treated, additionally making it possible to penetrate the pockets atraumatically, but also to more effectively clean plane root surfaces inside larger alveoli.

20 It will be noted that the length of the blade 1 is similar to that of the known endodontic files, that is to say of the order of 12 to 25 mm and with a thickness of the order of 0.1 to 3 mm.

25 Figure 2 shows an embodiment variant of the instrument for periodontal treatment in which the bushing 7 does not pass through said head 2, thus affording the advantage of reducing the number of sealing members to a single sealing member 13.

30 According to an embodiment variant not shown here, the blade 1 of the instrument is mounted in an articulated manner on the head, for example by means of a hinge of the

ball-and-socket type, thus affording the possibility of orienting the position of the active part of the blade with respect to the grip of the apparatus.

5 From reading the above description, it will be appreciated that the instrument for periodontal treatment according to the present invention is relatively simple to produce and permits treatment that is rapid and atraumatic for the patient. In addition, this is an instrument which does not require a surgical intervention, in contrast to  
10 procedures with curettes which, for deep periodontal pockets, require cutting of flaps.

Although the invention has been described in connection with two particular embodiments, it includes all technical equivalents of the means described.

15 Thus, for example, the shape of the blade which, instead of the optimal straight shape, could be narrowed in the direction of the tip in order to adapt it to use inside gingival alveoli. Likewise, the blade 1 can have any suitable cross section, for example elliptic.

20 Likewise, it will be noted that the instrument for periodontal treatment according to the invention may, if appropriate, be disposable.